



Hydrography, circulation and suspended particle distribution in Ushuaia Bay and the Beagle Channel

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The Beagle Channel and in particular Ushuaia Bay, are subantarctic environments where mixing processes between oceanic and continental waters, and strong land-to-sea exchanges of water and particulate matter are taking place. Multiple sources of particulate matter to the channel can be identified: glaciers, rivers, direct runoff from forests along steep slopes next to the seashore, marine primary production as well as an anthropogenic contribution related to navigation and human settlements, especially the city of Ushuaia. This study is a preliminary assessment of suspended matter concentrations, composition, distribution and particle size spectra in Ushuaia Bay and the neighbouring Beagle Channel for two contrasting hydrographic settings: late summer stratified and late winter unstratified conditions. The relationships of the nephelometric and particle spectra results are compared with the main hydrographic features. Intermediate nepheloid layers evolving into bottom nepheloid layers are recurrently observed on the slopes of the 150-m deep drowned glacier valley that occupies the eastern half of Ushuaia Bay. These relatively turbid layers are associated with relative oxygen minima that in certain years result in a hypoxic area developing in the deep valley. The volumic size spectra of suspended particles is dominated by aggregates of few tens to few hundreds microns. Particle size spectra show a bimodal distribution in the austral winter that tends to unimodal in the austral summer, in concordance with the vertical structure of the water column: seasonal halocline separates both particle pools in summer while winter mixing homogenizes them.